

## CLAIMS:

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1. A magnetic resonance imaging apparatus comprising:  
an RF coil system (9, 10, 11, 12) comprising at least two sets of at least two  
RF coils for detecting RF signals from a region of interest,  
at least two receiver channels (C1, C2) for receiving and processing the  
5 detected RF signals, and  
a control unit (51, 52, 53; 31) for selecting and/or combining the RF signals of  
at least two RF coils in dependence on the imaging parameters and for applying the selected  
and/or the combined RF signals to separate receiver channels.
- 10 2. A magnetic resonance imaging apparatus as claimed in claim 1,  
wherein said control unit (51, 52, 53; 31) is provided to combine the RF signals of several  
groups of at least two RF coils into a separate receiver channel.
- 15 3. A magnetic resonance imaging apparatus as claimed in claim 1,  
wherein said RF coil system (9, 10, 11, 12) comprises two sets of four RF coils.
4. A magnetic resonance imaging apparatus as claimed in claim 3,  
wherein said RF coil system (9, 10, 11, 12) comprises a birdcage head coil arrangement.
- 20 5. A magnetic resonance imaging apparatus as claimed in claim 4,  
wherein said control unit (51, 52, 53; 31) is provided to combine the RF signals of RF coils  
arranged on opposite sides of the head.
- 25 6. A magnetic resonance imaging apparatus as claimed in claim 4,  
wherein said control unit (51, 52, 53; 31) is provided to combine the RF signals of  
neighboring RF coils.
7. A magnetic resonance imaging apparatus as claimed in claim 1,

wherein said control unit (51, 52, 53; 31) is provided to select and/or combine the RF signals of at least two RF coils in dependence on the phase encoding direction.

8. A magnetic resonance imaging apparatus as claimed in claim 1,  
wherein said control unit (51, 52, 53; 31) is provided to select and/or combine the RF signals of at least two RF coils in dependence on the desired SENSE reduction direction.

9. A magnetic resonance imaging method, comprising the steps of:  
detecting RF signals from a region of interest while using an RF coil system (9, 10, 11, 12) comprising at least two sets of at least two RF coils,  
receiving and processing the detected RF signals while using at least two receiver channels (C1, C2), and  
selecting and/or combining the RF signals of at least two RF coils in dependence on the imaging parameters and applying the selected and/or the combined RF signals to separate receiver channels.